

VALIDATING BOTANICAL NAMES BY REFERRING TO INVALID LITERATURE

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1. Introduction

Two recent papers, one on *Epipogium* by Dr. T. A. SPRAGUE and Miss M. L. GREEN (*Kew Bull.* 1937, pp. 475-476) and the other on *Pterocarpus* by Mr. H. K. AIRY-SHAW (*Kew Bull.* 1937 pp. 477-479), have created what seems to me to be an undesirable precedent for validating botanical names by reference to pre-1753 literature. This procedure, at one time considered legitimate, was later rejected in order that the Linnean genera might retain the sense given to them in *Species Plantarum* ed. 1 (1753)—often an impossibility if reference by LINNAEUS to pre-1753 literature were admitted as valid. That to revert to this procedure now would violate the provision of the Rules of Botanical Nomenclature (ed. 3, 1935) and lead to many difficulties is clearly demonstrated by a consideration of the two above-mentioned cases.

2. The Case of *Epipogium*

In the remarks following the description of the new genus *Gastrodia*, published in *Prodromus Florae Novae Hollandiae* (1810 p. 330) ROBERT BROWN, the author of the work, observes as follows:—

“Affinitatem haud levem habet cum *Epipogio* (quod *Limodorum Epipogium* Sw.,) praesertim Anthera decidua

Again, on p. 331 of the same work and under the new genus, *Dipodium*, the same author makes the following statement:—

“.....; de *Epipogio* GMEL. iam dictum est.”

Now Dr. SPRAGUE and Miss GREEN (*Kew Bull.* 1937 pp.

475-476) regard these two statements of R. BROWN as constituting, when joined together, "the first valid publication" of the genus *Epipogium*. They argue as follows:—

"There [in R. BROWN's *Prod.* pp. 330 and 331] it is unaccompanied by a description, but *Epipogium* is attributed by R. BROWN, on p. 331, to GMELIN, who gave the generic description under the spelling *Epipogium* (*Fl. Sibir.* I, 11: 1747). The citation of GMELIN by ROBERT BROWN is an *implicit* reference to GMELIN's previously and effectively published description, and accordingly validates the name *Epipogium* R.BR. under the International Rules, Art. 37

"The case of *Epipogium* illustrates the point that, under the International Rules, the citation of a previously and effectively published description of a genus need not include a precise reference to its place of publication, so long as there is no reasonable doubt as to the work intended."

3. The Case of *Pterocarpus*

In *Kew Bulletin* (1937 pp. 477-479) Mr. AIRY-SHAW discusses the genus *Pterocarpus* published by JACQUIN (*Sel. Stirp. Amer. Hist.* 1763, p. 283). According to Mr. AIRY-SHAW, JACQUIN gave neither description nor generic citation, but referred under the specific name *P. officinalis* to "Linn. mat. med. 522" (*i.e.* LINNAEUS's *Materia Medica*, 1749 p. 522 where the name *Pterocarpus* occurs). In this work there is no generic description of *Pterocarpus*, but there are references to previous literature. Mr. AIRY-SHAW concludes therefore:—

"JACQUIN's reference to LINN. Mat. Med. constitutes an indirect citation, since LINNAEUS there refers back to his *Fl. Zeyl.* where a description of *Pterocarpus* was 'previously and effectively published'."

Mr. AIRY-SHAW then explains how *Pterocarpus* of *Flora Zeylanica* is a mixture of *Daemonorops* (palm), *Derris* and *Pterocarpus*, so that it is a *nomen confusum*. He therefore proposes that it should be listed in Appendix V which is being prepared under the provisions of Art. 64 of the Nomenclature Rules.

4. Objections Stated

The objections *a-b* apply to the case of *Epipogium* only, while objections *c-e* apply to both the cases.

(a) It is unreasonable to oblige a reader to look to the observations made under two different genera (*Gastrodia* and *Dipodium*) in order to find out whether or not a third genus (*Epipogium*) has been validly published. For if this were to be regarded as permissible procedure,

then it would mean that a genus could be validly described piecemeal in several places, though each part by itself would be invalid.*

(b) The second objection seems to violate the new legislation concerning Provisional Names, adopted at the Amsterdam Congress (1935) which ordains as follows:—

“A name proposed provisionally (nomen provisorium) in anticipation of the group, ..., or merely mentioned incidentally is not validly published.”

I submit that both the references made by ROBERT BROWN to *Epipogium*, whether taken individually or together, ought to be included under the clause italicized. If the clause does not apply to such cases, its wording is ambiguous and its meaning should be more precisely defined.

(The only definite reference made under *Epipogium* by ROBERT BROWN is to *Limodorum Epipogium* SW. but that reference, according to Dr. SPRAGUE and Miss GREEN’S treatment of the case, did not validate the genus *Epipogium*).

(c) Dr. SPRAGUE and Miss GREEN invoke Art. 37 in support of their contention that the references given by them constitute “the first valid publication” of the genus *Epipogium*. But Art. 42 deals expressly with the validity of generic names: it reads as follows:—

“A name of a genus is not validly published unless it is accompanied (1) by a description, or (2) by the citation of a previously and effectively published description of the genus under another name; or (3) by a reference to previously and effectively published description of the genus as a subgenus, section or other subdivision of a genus.”

Now neither Dr. SPRAGUE and Miss GREEN, nor Mr. AIRY-SHAW, have claimed validation for either of the genera (*Epipogium* and *Pterocarpus*) under Art. 42 (1) or Art. 42 (3). Mr. AIRY-SHAW claims validation of the genus *Pterocarpus* [L] JACQ. (1763) under Art. 42 (2), but neither he nor Dr. SPRAGUE and Miss GREEN have shown that the descriptions referred to under either *Epipogium* or *Pterocarpus* were published “under another name.”

* I do not know why Dr. SPRAGUE and Miss GREEN selected references made to *Epipogium* on pp. 330 & 331 (in R.BR., *Prodr. Fl. Nov. Holl.*) and omitted to consider the one on p. 310 which reads as follows:—

“Hinc quatuor Swartzianis sectionibus quintam adjecimus, adhucdum parvulam, ad quam, præter *Gastrodium*, pertinet *Epipogium* GMEL., perperam *Limodoris* associatum.”

In the copy I consulted all the three pages are indicated in the general Index of the work under *Epipogium*. The case, considered on this reference alone, would have been less weak, for the objection (a) would not have been applicable to it.

(d) *Epipogium* and *Pterocarpus* are said to have been validated by a reference to pre-1753 literature; but Art. 20 invalidates this literature.

If references to such invalid literature are permitted, what is the significance of the clauses in Arts. 20 and 42 which fix, for vascular plants, 1753–1754 as the starting-point of botanical nomenclature and the names of genera. These clauses run thus:—

“It is agreed to associate generic names which appear in LINNAEUS’S *Species Plantarum* ed. 1 (1753) and ed. 2 (1762–63) with the first subsequent descriptions given under those names in LINNAEUS’S *Genera Plantarum* ed. 5 (1754) and ed. 6 (1764).” (Art. 20).

“An exception is made for the generic names published by LINNAEUS in *Species Plantarum* ed. 1 (1753) and ed. 2 (1762–63) which are treated as having been validly published on those dates.” (Art. 42).*

In the case of the old generic names (e.g. *Pterocarpus*) adopted in either of the two editions of LINNAEUS’S *Species Plantarum* these clauses would not only be superfluous but they would also be misleading, especially in regard to the words “first subsequent descriptions” in Art. 20; for all these old names would be valid by reference given by LINNAEUS to the literature invalidated under Art. 20.

Thus to accept as valid references to invalid literature, we would be violating the very principles which in 1905 obliged botanists to prohibit the Linnean genera adopted in *Species Plantarum* ed. 1 from being interpreted on the references to literature invalidated under Art. 20 though previously, it seems, such interpretations had been advocated by A. DE. CANDOLLE, J. BRIQUET, O. F. COOK, OTTO KUNTZE and others. In fact, it is said that the startling changes advocated by KUNTZE in his *Revisio* (1891) were the principal cause bringing about *volte face* in the views widely held previously. J. BRIQUET (formerly a supporter of the other procedure) advised the Vienna Congress (1905) to choose 1753–54 instead of LINNAEUS’S *Genera Plantarum* ed. 1 (1737) or TOURNEFORT’S *Institutiones* (1700) (advocated previously by many botanists) as the starting-point of the genera under the binary system, a ruling altered at the Cambridge Congress (1930) in order to

* Here I may draw the attention of botanists to the fact that in splitting Art. 38 of 1910–Rules into Arts. 41 & 42 of the 1935–Rules, the clause containing the exemption to the generic names published in LINNAEUS’S *Species Plantarum* was placed under Art. 42, but its more appropriate place seems to be in Art. 41. In fact in the 1910 Rules this clause was placed immediately after the sentence which formed the basis, not of Art. 42, but of Art. 41, of the New Rules. I think this misplacement is one of the reasons why the significance of the exemption as well as of Arts. 20 and 41 is not fully appreciated.

include the genera in LINNAEUS's *Species Plantarum* ed. 2 (1762-63), and embodied in the above transcribed clauses of Arts. 20 and 42.*

(e) If a genus can be established nomenclaturally by such slender means as that of *Epipogium* and *Pterocarpus* as suggested by Dr. SPRAGUE and Miss GREEN, and by Mr. AIRY-SHAW, then botanists may ask what is the purpose of the whole structure of nomenclature built up by the Rules. For references to such invalid literature, if permitted, would render the Rules ineffective and of no account for preventing procedures condemned under the Rules, and the mere registration in nomenclators like *Index Kewensis* of invalid genera, species, etc., published in utter disregard of the provisions regulating the description of botanical names, would have to be considered as constituting valid publication by reference.

5. Examples

(1) In *Species Plantarum* ed. 1 (1753, p. 443), LINNAEUS published several species under *Rhizophora* but did not give a generic description. The name *Rhizophora* was published by LINNAEUS seven years earlier in his *Flora Zeylanica* (1747, p. 181), where it was apparently used both as a "generic" and a "specific" name. (I have not been able to consult this work; my information is indirect). The species described in *Flora Zeylanica* was named *Rhizophora conjugata* in *Species Plantarum*, a reference being given to *Flora Zeylanica*. No other species described in *Species Plantarum* had previously been referred to *Rhizophora*.

Hence, if references to literature invalidated under Art. 20 were permitted under the Rules, then the genus *Rhizophora* would be valid, not because of the exceptional privileges accorded to the Linnean genera in Arts. 20 and 42,

* The following statement of Mrs. VERA HIGGINS in her book "*The Naming of Plants*" London (1937) is erroneous as far as the starting-point of genera is concerned: "..... his [LINNAEUS's] two books 'Genera Plantarum' (1737) and 'Species Plantarum' (1753) have been taken as the starting-point of modern nomenclature" (p. 46). In the reviews I have seen of this book, this error has not been pointed out.

A few pages later Mrs. HIGGINS makes a statement which, though not conveying the full force of the legislation on the point, comes very much nearer the truth:

"..... at the International Botanical Congress at Vienna in 1905 it was finally agreed that only names published in LINNAEUS's 'Species Plantarum' or subsequently should count; thus 1753, the date of publication, was made the artificial starting-point for modern nomenclature, and though earlier names might be consulted if necessary, they were not considered valid if they differed from those given by LINNAEUS". (p. 48).

but because of the explicit reference to *Flora Zeylanica* given by LINNAEUS under *R. conjugata*, and the genus would therefore have to be interpreted by reference to *R. conjugata*, the only species described in *Flora Zeylanica*.

This would mean that the lectotype (*R. mangle* L.) selected in *Supplementum* II of the Rules would have to be rejected as untenable, that *Rhizophora* would become synonymous with *Bruguiera* LAM. (1796), the type of the latter being *R. conjugata* L., and that what now passes as *Rhizophora* L. would require a new name.

It might be argued that, according to *species lectotypicae* of the Linnean generic names (International Rules ed. 3 pp. 139-143), the genus *Rhizophora* must be interpreted with reference to *R. mangle* L. the standard or lectotype species indicated for the genus as used in *Species Plantarum* (1753). But the answer would be that, according to the resolution made at the Amsterdam Congress, 1935 (*Proceedings* I, 1936 p. 366), those lectotype species need not be adopted by botanists if "there is clear reason for rejecting any species in favour of another". Thus those who maintain that references to invalid literature are permitted under the Rules, would be able to offer, as one very clear reason for rejecting *R. mangle* L. in favour of *R. conjugata* L., the fact that the taxonomic group indicated by the latter is the only one included under *Rhizophora* of LINNAEUS'S *Flora Zeylanica* (l.c.), so that no other species could be selected as the type of a genus validated by a reference to *Rhizophora* L. of *Flora Zeylanica*. On the other hand, if my contention is admitted and references to invalid literature are rejected for the purpose of validating a name, then *R. mangle* L. can be accepted as the lectotype species of *Rhizophora* L. as published in 1753.

(2) Assuming that the references to pre-1753 literature were valid, Mr. AIRY-SHAW showed that *Pterocarpus* [L.] JACQ. (1763) was a *nomen confusum* to be rejected under Art. 64. But, notwithstanding this rejection, *Pterocarpus* L. (*Sp. Pl.* ed. 2: 1763) would become a later homonym of *Pterocarpus* JACQ., and therefore, according to Art. 61, a non-legitimable name. If *Pterocarpus* L. (1763) was conserved against *Pterocarpus* JACQ., then the former would again be found to be a *nomen confusum*, because in *Species Plantarum* ed. 2 (1763) LINNAEUS quoted, besides LINN. *Mat. Med.* and JACQUIN'S description of *Pterocarpus officinalis*, also *Lingoum* RUMPH., *Amboin.* II (p. 205 t. 70) and *Draco Arbor* LOEFL. *it.* (266: 273 n. 147: 168).

If these references were held to have validated the genus, one could not go to LINNAEUS'S *Genera Plantarum* ed. 2 (1764) to interpret the genus already validated a year

earlier in *Species Plantarum* ed. 2. (1763) by the same or similar references used by JACQUIN, and one would have to discard also *Pterocarpus* L. (1763) as a *nomen confusum*.

But if reference to *Flora Zeylanica* was permissible, then one could claim that the genus *Pterocarpus* [L.] was validated by BURMANN in his *Index* to RUMPHIUS'S *Herbarium Amboinense* published in 1755 (p. 11) by reference to *Lingoum* RUMPH. (on one side) and *Flora Zeylanica* (on the other). This would render the rejection of *Pterocarpus* JACQ. in order to conserve *Pterocarpus* L. (1763) unnecessary, because both of these names would be later homonyms of *Pterocarpus* L. *ex* BURMANN (1755).

With equally good reason it could be claimed that *Lingoum* RUMPH. *ex* BURM. (*Index*, 1755) and not *Pterocarpus* L. *ex* BURM. was the legitimate name for the genus, and that it included three distinct species: *L. rubrum* RUMPH., *L. molle* RUMPH., and *L. saxatile* RUMPH., all validated through explicit or implicit references by BURMANN in the aforementioned *Index*. It would follow that these binomials would have priority both over *P. officinalis* and *P. Draco*, and that ADANSON (*Fam.* II, 1763, p. 319) would have been right in adopting *Lingoum* as the legitimate name for the genus.

(3) An incursion into pre-1753 history of the use of *Lobelia*, a name adopted by LINNAEUS as a generic name in his *Species Plantarum* (1753) would also yield similar results. The earliest use of the name *Lobelia* prior to 1753 is by PLUMIER (*Gen.*, 1703 p. 21, t. 31). Now if one were to interpret *Lobelia* L. (1753) with reference to *Lobelia* PLUM. (1703) to which LINNAEUS referred under *L. Plumieri* L. (1753), *Lobelia* L. would become synonymous with *Scaevola* L. (GOODENIACEAE); consequently the lectotype-species indicated in the Rules for the genus as a member of LOBELIACEAE would become useless for the genus as a member of GOODENIACEAE. Should this be granted, then under Art. 66 the family name LOBELIACEAE *quoad genus typicum* would be a synonym of GOODENIACEAE, and LOBELIACEAE *ex altera parte* would require a new name. According to my contention the history of *Lobelia* as a valid genus started in 1753; and the types of descriptions and names published prior to 1753 are really "prehistoric" as far as the valid plant-nomenclature is concerned. It is a misnomer to label a specimen, described in literature condemned by the Rules, as a "historic type" of a valid genus merely because, when the genus was being validated, an implicit or explicit reference was made to a previous invalid description or name. Much confusion has been created both by calling such types "historic" and by focussing on

them an undue attention. When recommending lectotype-species for the Linnean genera, neither the late Dr. A. S. HITCHCOCK, nor Miss GREEN attached any importance to the "historic" types; in fact, in typifying *Lobelia*, Miss GREEN rejected the "historic type" and recommended *L. cardinalis* L. (1753) as the lectotype-species for the genus (*International Rules* 1935). Had they followed Mr. AIRY-SHAW'S procedure, they would have found that a great number of Linnean genera would have to be proposed as *nomina confusa*. The procedure of ignoring the "historic type", though opposed to the contention of Dr. SPRAGUE, Miss GREEN and of Mr. AIRY-SHAW, is entirely in accord with my interpretation of Art. 20, and with my contention concerning the value, in nomenclature, of references to invalid literature.

Such a result was no doubt foreseen by the legislators who met at the Vienna Congress in 1905 and invalidated the botanical literature published previous to the year 1753, fixing 1753-1754 as the starting-points for the genera of vascular plants, even for those genera which LINNAEUS had published before 1753 and adopted in his *Species Plantarum* ed. 1753.* The reference back, if admitted, may take us not only to LINNAEUS'S own works published before the year 1753, but also to others including PLINY, THEOPHRASTUS and MOSES; and the whole force of the ruling of Art. 20 would be lost.

The above instances clearly demonstrate "some curious anomalies and complexities" (to quote the phrase of Mr. AIRY-SHAW) which will have to be faced if references to literature invalidated under Art. 20 are even admitted.

* That LINNAEUS in preparing his *Species Plantarum* (1753) changed the interpretation of many old names or relegated them to synonymy in order to make room for the new ones, was well known even to his contemporaries: "I have had pleasure", wrote PETER COLLINSON in a letter dated 20th April 1754 and addressed to LINNAEUS, "of reading your *Species Plantarum*, a very useful and laborious work. But, my dear friend, we that admire you are much concerned that you should perplex the delightful science of botany with changing names that have been well received, and adding new names quite unknown to us. Thus botany, which was a pleasant study and attainable by most men, is now become, by alterations and new names, the study of a man's life, and none now but real professors can pretend to attain it. As I love you I tell you our sentiments." And again writing after the appearance of the 5th edition of LINNAEUS'S *Genera Plantarum* (1754), in a letter dated 10th April 1755, COLLINSON said: "You have begun by your *Species Plantarum*; but if you will forever be making new names, and altering good and old ones, for such hard names that convey no idea of the plant, it will be impossible to attain to a perfect knowledge in the science of botany."

6. Conclusions

Applying the terms valid and invalid as precised by me in *Gard. Bull. Straits Settl.* IX Part. 3 (1937) to literature and references in order to indicate whether or not they are counted botanically, and from the foregoing discussions we may deduce the following:—

i. LITERATURE is *valid* only if it is counted botanically. Otherwise it is *invalid*.

ii. LITERATURE in order to be *valid* must not only be *effective* under Art. 36 but also *satisfy other conditions* explicitly or implicitly laid down as essential in the Rules.

iii. LITERATURE which botanists have to disregard because of the special ruling in Art. 20 should be *invalid*.

iv. No *Botanical Name* can be admitted as *valid* unless (1) it satisfies the conditions laid down as essential for the word or words constituting the name itself, and (2) it is accompanied by either (a) a valid description, or (b) a valid reference (*see below v*).

(In certain circumstances a plate with analyses is accepted as equivalent to a valid description. cf. Arts. 43 and 44).

v. A REFERENCE is *valid* when it refers to a description published both in valid literature, and in accordance with the rules laid down as essential for the words constituting the description.

vi. Consequently ALL REFERENCES TO INVALID LITERATURE, even when they include plates, should be *inadmissible* under the Rules.

vii. SEVERAL NAMES (formerly ignored but recently resurrected and made the bases of many nomenclatural changes) whose sole claim for validity is that they were referred to a plate or description in invalid literature should be *invalid*: e.g.

(1) In O. STICKMAN'S Dissertation on RUMPHIUS'S *Herbarium Amboinense* eds. 1754 and 1759, accepted as valid by Dr. E. D. MERRILL (*Interpr. RUMPH. Herb. Amboin.* 1917).

(2) In BURMANN'S *Index* to RUMPHIUS'S *Herbarium Amboinense* eds. 1755 and 1769, accepted as valid by Dr. MERRILL (*cf. op. cit.*).

(3) In ROXBURGH'S *Hortus Bengalensis* (1814), accepted as valid by the late Dr. C. B. ROBINSON (*Philipp. Journ. Sci.* VII, 1912, pp. 411–419) because ROXBURGH had referred under the names to plates in RUMPHIUS'S *Herb. Amb.*

- (4) In MOON'S *Catalogue of Indigenous and Exotic Plants of Ceylon* (1824) accepted as valid by Mr. A. H. G. ALSTON (*Ann. Roy. Bot. Gard. Peradeniya* XI, 1929 pp. 203-205) because they contain references to the plates or descriptions either in RHEEDE'S *Hortus Malabaricus* or in RUMPHIUS'S *Herbarium Amboinense*.
- (5) Several generic and specific names listed in nomenclators and *Index Kewensis* with references to invalid descriptions, whether or not published in valid publications.

viii. THE NAMES IN PRE-1753 LITERATURE (and in fact in all invalid literature) must be given the same status and treatment as the names *in scheda*. No one who adopts the name of a manuscript species need consider the types studied by the author of the manuscript name (*chironym*). The botanist who validates the name is free to choose his own types, even to the extent of ignoring entirely the specimen on which the manuscript name was noticed. The mere fact that the author of the manuscript name and the herbarium wherein the name was found have been quoted, must not be taken as the sure indication that the types of the manuscript name are to be included in typifying the name as published by the second botanist. This principle is likewise applicable to references to invalid literature. In using an invalid name the older botanists frequently quoted the invalid reference, not because they adopted any of the types of invalid name, but because they wanted to indicate the persons responsible for coining or using the name previous to its actual valid publication; the citation of the invalid literature did not necessarily mean that the original sense was retained in the name as newly instated. Hence the value of the legislation which, besides invalidating pre-1753 names, fixed 1753-1754 as the starting point of nomenclature not only of species but also of genera, of vascular plants (*cf.* Arts. 20 and 42).

ix. *Pterocarpus* JACQ. (1763), *Pterocarpus* BURMANN (1755) and *Epipogium* R. BR. (1810) are consequently *invalid* names.

x. *Pterocarpus officinalis* JACQ. (1763) which is accepted by Mr. AIRY-SHAW (*Kew Bull.* 1937 p. 63) both as valid and as legitimate is *invalid* because the specific epithet was published under an invalid generic name, and, therefore, cannot be included in considerations of priority.

xi. *Pterocarpus* L. (1763) is a *valid* generic name because of the exceptional privileges conceded under Arts. 20 and 42 to the generic names used in *Species Plantarum* eds. 1 and 2.

xii. *Pterocarpus Draco* L. (1763) rejected by Mr. AIRY-SHAW (*Kew Bull.* 1937 p. 63) as a superfluous name of *P. officinalis* JACQ. (1763) is both a *valid* and a *legitimate* name for the lectotype of the genus *Pterocarpus* L. (1763).

7. Appendix

From the quotation by Dr. SPRAGUE and Miss GREEN of the bibliography and synonymy of *Epipogium*, and from the bibliography of the species as given in *Index Kewensis*, it seems that the rejection of *Epipogium* GMEL. *ex.* R. BR. (1810) as invalid would entail no changes, other than orthographical, in the names of the genus and of the species retained under it. However, if the general rejection of references to invalid literature should require changes in the long accepted nomenclature of many genera comprising several species, then such changes could be prevented by placing the genera in *nomina generica conservanda*; but no such decision should be made before the actual need for such a conservation has been fully demonstrated.
